

# BREEDING SEASON AND CONSERVATION OF THE TERNS *STERNA FUSCATA* AND *ANOUS STOLIDUS* IN THE LAKSHADWEEP

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(With two text-figures)

The Lakshadweep or Laccadive island (Lat. 6°-12° 30' N, Long. 71°-74° E) consist of twenty six uninhabited and ten inhabited islands, situated at distances of 155-248 km from Cochin on the Western coast of India. The climate is warm and humid and the annual rainfall recorded in an inhabited island was 1500-1650 mm. The islands rise only 1-2 m above sea level and have no rivers. The human population rose from 13,861 in 1901 to 51,681 in 1990. Coconut trees and fishes are important natural resources, while low grade phosphates derived from bird droppings and calcium carbonate sands are important mineral resources of the islands.

Pitti, a 1.2 hectare barren and uninhabited island has supported breeding colonies of thousands of the terns, *Anous stolidus* (Noddy) and *Sterna fuscata* (Sooty). Several observers have visited Pitti and recorded the conditions of nesting terns and made crude estimates of the number of birds present between 1963 and 1995. We visited Pitti more frequently between 1990 and 1995. The exact timings and length of the breeding season of terns could not be determined so far due to the high winds which make landing and staying for a long time on Pitti extremely risky.

The following is a consolidated summary of the recent observations of the tern breeding colony of Pitti. In this paper we are examining the scanty data available so far on the terns of Pitti, to see if it is possible to suggest any pattern in the timing of breeding of the birds on this island.

**The breeding season:** The islanders who collect tern eggs regularly from Pitti, believe that

collection of eggs will not endanger the survival of terns in Pitti as the birds either breed throughout the year or have a sufficiently long breeding season. They believe that collection of eggs early in the breeding season will be compensated by laying again later. However, we do not share that view for the following reasons:

1. Pitti is only 1.2 hectare in area and it cannot hold much more than 1 lakh breeding birds and no observer has estimated the tern population to be over 20-30 thousand birds. If the colony had been expanding there should have been more than a lakh of terns in Pitti.

2. Much larger breeding colonies of sooty terns holding millions of birds have disappeared during the last 50 years from the Western parts of tropical Indian Ocean (Feare 1984).

3. No ornithologist has visited Pitti between June and August. It is impossible to say at present whether the terns continue to breed during these monsoon months or have a break and resume breeding in September.

**How do the terns survive in Pitti?** With the limitation due to lack of information on the activities of terns from June to August, we can point out the following as the options available to the terns nesting in Pitti:

1. By a normal long breeding season starting from April and ending in December during which sufficiently large numbers of chicks survive.

2. By acyclic breeding in which breeding takes place at a cycle of 9-10 months instead of 12 months.

**Which of the options do the terns use?** 1. If the terns were breeding during the months of fair weather only, it is doubtful if even fifty percent of the eggs would be productive as egg collection is

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TABLE 1

Year	Observers	Estimates of the total (of all terns) in Pitti	Remarks
1963 October	Mathew and Ambedkar (Unpublished)	20,000	Nesting activity in progress collections strictly prohibited.
1978 February	Mathew (unpublished)	12,000	Nesting of sooty terns in progress both adults and eggs collected by human beings.
1986 April	Deepakumar	No estimates	Sooty terns, Noddy, Large Crested terns nesting.
1988 December	Deepakumar	13,000 to 15,000	Found no chicks but about 400 eggs.
1990 May	Mathew, Rajan	4,000	Egg laying in progress of both Sooty and Noddy. Eggs and birds collected by humans.
1991 February	Tara Gandhi, Mathew, Santharam, G. Mathew	2,000	No nesting activity.
1991 April	Mathew, Santharam, G. Mathew, Rajan	8,000	Both Sooty and Noddy terns nesting. No chicks. All the eggs laid collected by humans.
1993 October	Mathew, G. Mathew, Raheem	6,638	Noddy tern fewer with chicks. Sooty and Large Crested terns incubating and with newly hatched young.
1994 May	Mathew, Raheem	3,000	Noddy tern nesting.
1995 September	Raheem, Mathew	6,700	No eggs. 600-700 young of Sooty terns.

easier at this time. Pitti can be approached safely from three inhabited islands up to the middle of May. Our experience has been that the eggs laid till early May, chicks and even some adult birds are collected. Chances of survival are perhaps better from September to December as human predation will be less severe, weather conditions being unpredictable during this period. During severe storms, eggs and chicks are said to be swept away and destroyed. Crabs and Turn-stones also take a heavy toll of the eggs during the breeding season.

2. The climatic conditions in recent years are so unpredictable that it will be harmful to the terns

to have fixed and normal annual breeding cycle. If the breeding season was exactly cyclic, one would always find the same breeding chronology year after year, which is not the case. Again Lakshadweep seas have many areas of upwelling (Nair *et al.* 1986) and there does not appear to be any shortage of prey animals for birds. So availability of food may not be an important factor influencing nesting success in Pitti, so much so that there is no particular advantage in breeding annually.

3. Non-annual cycles: Ashmole (1971) in Perrins (1983) pointed out how a small number of seabirds like the bridled terns on Cousin Island and



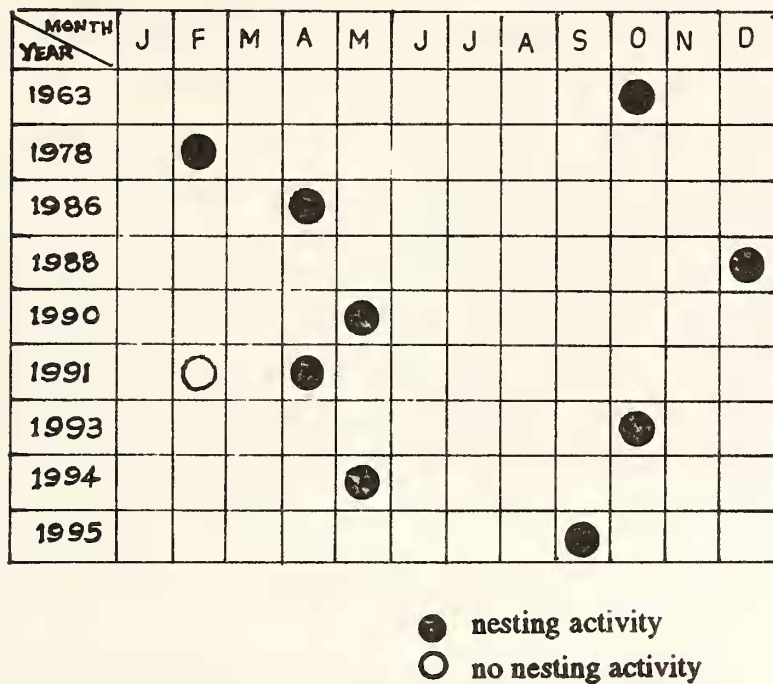


Fig. 1. The nesting cycle of terns breeding on Pitti.

sooty terns on Ascension Island have non-annual breeding cycles. The bridled tern breeds every eight months and the sooty tern every 9.6 months.

In the statement above, the months on which terns were noted nesting in Pitti during the last four decades are presented, with some details of nesting (Table 1).

From Table 1 it is certain that the terns of Pitti do not breed during the same months, year after year. It seems highly probable that they have a non annual cycle of 9-10 months like the Sooty Terns of Ascension Island. Such a cycle will have the added advantage of breeding four times every three years (Fig. 1)

STATUS OF BIRDS IN PITTI

Is the composition of birds of Pitti changing frequently due to emigration and immigration? In 1963, Mathew and Ambedkar ringed over thirty juvenile terns in Pitti. None of these were ever reported. So far we have never received reports of recaptured terns ringed in other oceanic islands in the Lakshadweep. In Seychelles a sooty tern ringed as a chick in New Zealand in 1961 was recovered (Feare, pers. comm.) in 1995. This points to the migratory habits and longevity of these terns.

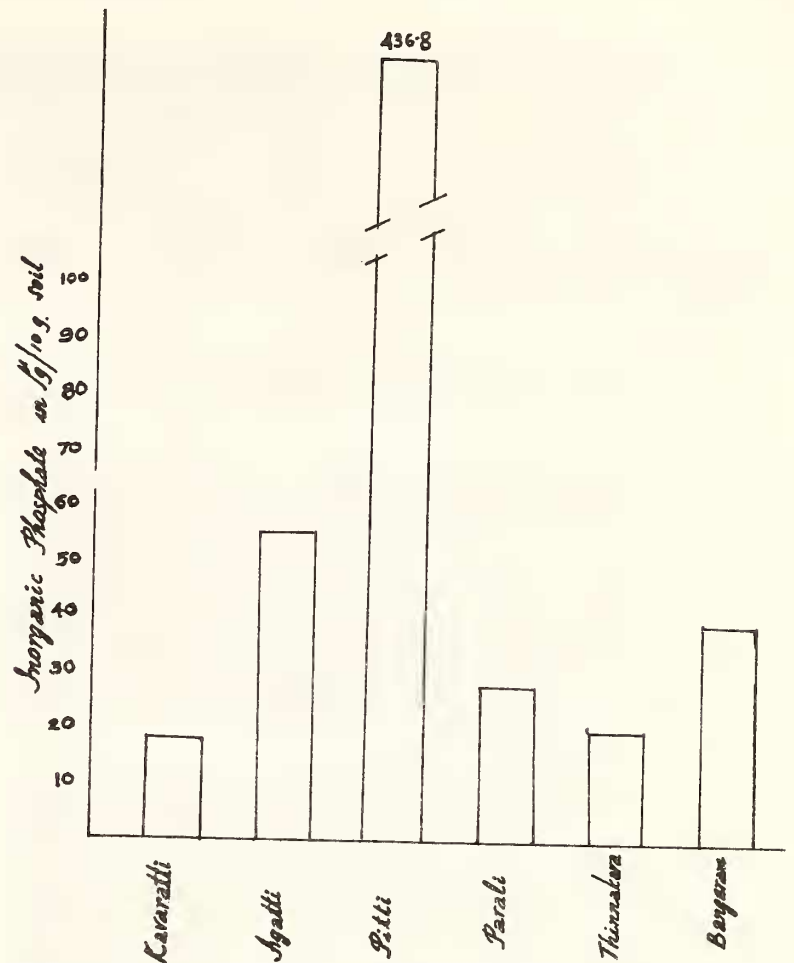


Fig. 2. Phosphate content of the soil samples collected from different islands.

Are the persons receiving ringed birds in Lakshadweep not revealing the fact due to fear of punishment? This is also possible as the birds are protected by law. It appears highly likely that the terns of Pitti are more mobile than they appear to be now. This has to be determined by ringing birds in Pitti.

**Large Crested Terns breeding on the Pitti:** In October 1993, D.N. Mathew and G. Mathew found Large Crested terns incubating eggs between rows of Sooty terns. There was no conflict between these two species but sooty terns and noddy terns always nested in distant areas of Pitti.

**Brownwinged Terns:** The last record of the brownwinged tern nesting in the Lakshadweep Islands was that of Mathew and Ambedkar (1963) at Cherbaniani. Deepakumar who visited the island in 1986 could not find any brownwinged terns.

**The role of terns in the island's economy:** The tern colony is valuable to the island's ecology and economy in several ways. The birds feed on the small fish spratelloides which is a favourite food of

Tuna fish and the islanders use flocks of terns feeding in the sea as tuna indicators. Feeding on the fish of the ocean and resting on the islands, the terns play a significant role in nutrient cycling, particularly of phosphorus. Soil samples taken from Pitti were rich in phosphates (Fig. 2).

#### SUMMARY AND RECOMMENDATIONS

1. The length and pattern of breeding season of the terns of Pitti still remain unresolved due to the absence of data during the monsoon months.

2. Information collected so far suggests that the Sooty and Noddy terns breed acyclically on Pitti. The Large Crested tern appears to have a more restricted breeding season.

3. From the crude estimates obtained so far it would appear that the population of the terns of Pitti is not showing any appreciable increase in number, inspite of a long breeding season and declaration of Pitti as a sanctuary.

4. At present there is no information from recovery of marked birds to determine the exact status of the terns found on Pitti. It is suggested that a scheme for ringing birds should be started here.

5. Analysis of the soil samples collected from Pitti and other islands showed a very high value of Phosphate content in the samples from Pitti, revealing the role of terns in nutrient recycling.

6. It is very clear that the tern populations of Lakshadweep plays very vital roles in certain spheres of the ecology and economy of the islands. The Government of Lakshadweep has very wisely declared Pitti as a sanctuary and the collection of terns and their products as illegal.

Yet these laws are very difficult to enforce because of the distance of Pitti from inhabited islands. Added efforts must be made to educate the public through all possible media about the need to give complete protection to the breeding colony at Pitti.

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